



CITY OF ATLANTA

Kasim Reed
Mayor

SUITE 1900
55 TRINITY AVENUE, SW
ATLANTA, GA 30303
(404) 330-6204 Fax: (404) 658-7705
Internet Home Page: www.atlantaga.gov

DEPARTMENT OF PROCUREMENT
Adam L. Smith, Esq., CPPO, CPPB, CPPM, CPP,
CIPC, CISCC, CIGPM
Chief Procurement Officer
asmith@atlantaga.gov

July 17, 2015

Dear Potential Bidders:

Re: FC-8319 Installation, Relocation, Removal, and Repair of Traffic Signals

Attached is one (1) copy of **Addendum Number 4**, which is hereby made a part of the above-referenced project.

For additional information, please contact Katherine Vernet, Esq., at (404) 330-6517 or by email at kvernet@atlantaga.gov.

Sincerely,

Adam L. Smith

ALS/kv



Re: FC-8319 Installation, Relocation, Removal, and Repair of Traffic Signals
Addendum No. 4
July 17, 2015
Page 2

ADDENDUM NO. 4

This Addendum No. 4 forms a part of the Invitation to Bid and modifies the original solicitation package and any prior addenda as noted below and is issued to incorporate the following:

- **Bid Form:**
A revised bid form is attached hereto as Attachment No. 1. This document replaces Exhibit D, Bid Form of the solicitation document.
- **Scope of Work:**
A revised scope of work has been attached hereto as Attachment No. 2. This document replaces Exhibit E, Scope of Work or Services, of the solicitation document.

The Bid due date HAS NOT been modified and Bids are due on Monday, July 27, 2015 and should be time stamped in no later than 2:00 P.M. EDT and delivered to the address listed below:

Adam L. Smith, Esq., CPPO, CPPB, CPPM, CPP
Chief Procurement Officer
Department of Procurement
55 Trinity Avenue, S. W.
City Hall South, Suite 1900
Atlanta, Georgia 30303

****All other pertinent information is to remain unchanged****

Re: FC-8319 Installation, Relocation, Removal, and Repair of Traffic Signals
Addendum No. 4
July 17, 2015
Page 3

Acknowledgment of Addendum No. 4

Bidders must sign below and return this form with Bid response to the Department of Procurement.

Bidders must sign below and return this form with Bid to the Department of Procurement, 55 Trinity Avenue, City Hall South, Suite 1900, Atlanta, Georgia 30303 as acknowledgment of receipt of this Addendum.

This is to acknowledge receipt of **FC-8319 Installation, Relocation, Removal, and Repair of Traffic Signals** on this _____ day of _____, 20____.

Legal Company Name of Bidder

Signature of Authorized Representative

Printed Name

Title

Date

Attachment No. 1

Bid Form

**CITY OF ATLANTA
DEPARTMENT OF PUBLIC WORKS
OFFICE OF TRANSPORTATION**

BID FORM

ALL ITEMS LISTED BELOW SHALL INCLUDE PERFORMING ALL LABOR AND UTILIZING EQUIPMENT NECESSARY TO COMPLETE INSTALLATION, RELOCATION, REMOVAL, AND/OR REVISION OF TRAFFIC SIGNALS, REVERSIBLE LANE SIGNALS AND/OR STREET LIGHTS AND ASSOCIATED HARDWARE IN ACCORDANCE WITH CITY OF ATLANTA/GDOT SPECIFICATION, DRAWINGS AND STANDARDS:

(www.GDOT.gov and Click on the *Standards* option under the *Georgia Department of Transportation: Official Site* option)

- 1. Material Cost not to exceed + 18% Markup (Minus all taxes and fees)**
- 2. Concrete Work Unit Price per Square Yard \$_____**

Item #	Approximate Quantity	Unit	Description	Hourly Rate Written	Hourly Rate Figures
1.			LABOR COSTS		
1a.	1	Hour	Senior Electrician/Supt.		
1b.	1	Hour	Electrician		
1c.	1	Hour	Electrician Assistant		
1d.	1	Hour	Senior Project Manager		
1e.	1	Hour	Fiber Optic Cable Splicer		
1f.	1	Hour	Directional Boring Crew		
1g.	1	Hour	Quality Control Manager		
1h.	1	Hour	Laborer		
1i.	1	Hour	Certified Flagger		
1j.	1	Hour	Police Traffic Control		

Item #	Approximate Quantity	Unit	LABOR COSTS (Cont.)	Hourly Rate Written	Hourly Rate
1k.	1	Hour	Project Manager		
1l.	1	Hour	Emergency Response Costs		
1m.	1	Hour	WTCS (Worksite Traffic Control Supervisor)		
			TOTAL		

2.			EQUIPMENT COSTS		
2a.	1	Hour	Lift Truck/Aerial Truck		
2b.	1	Hour	Dump Truck		
2c.	1	Hour	Digger-Derrick Truck		
2d.	1	Hour	Pickup Truck		
2e.	1	Hour	Loop Saw		
2f.	1	Hour	Air Compressor		
2g.	1	Hour	Cutting Torch		
2h.	1	Hour	Pole Trailer		
2i.	1	Hour	Cable Reel Trailer		
2j.	1	Hour	Jack Hammer		
2k.	1	Hour	Generator		
2l.	1	Hour	Cable Puller		
2m.	1	Hour	Sump Pump		
2n.	1	Hour	Light Tower		
2o.	1	Hour	Pipe Jacket		
2p.	1	Hour	Back Hoe		
2q.	1	Hour	Hydro-vac machine		

Item #	Approximate Quantity	Unit	EQUIPMENT COSTS (Cont.) Description	Hourly Rate Written	Hourly Rate Figures
2r.	1	Hour	Stake Body Truck		
2s.	1	Hour	Service Van		
2t.	1	Hour	Equipment Trailer		
2u.	1	Hour	Aerial Cable Installation& Lashing Equipment		
2v.	1	Hour	Cable Reel Truck		
2w.	1	Hour	Loop Cutting/Water Truck		
2x.	1	Hour	Skid Steer(Bobcat)		
2y.	1	Hour	Fiber Optic Cable Splicing Trailer		
2z.	1	Each	Fiber Optic Splicing (Per Fiber Splice)		
2aa.	1	Hour	Directional Boring Machine		
2bb.	1	Hour	Arrow Board		
2cc.	1	Hour	Fiberglass Rodder		
2dd.	1	Hour	Fiber Optic Tester(OTDR)		
2ee.	1	Hour	Additional Equipment		
2ff.	1	Hour	Additional Equipment		
			TOTAL		

DETECTOR LOOP AND BURIED CABLE INSTALLATION

ITEM NO.	APPROX. QUANTITY	MATERIAL COST	UNIT COST	TOTAL COST
3	50 Ea.	Install 6' x 40' Quadropole Loop		
4	25 Ea.	Install 6' x 6' Setback Loop		
5	15 Ea.	Install Radar vehicle detection		
6	20 Ea.	Install IVDS		
7	500 ft.	Loop Installation per line ft. saw cut		
8	250 ft.	Loop cable direct burial		
9	200 ft.	Loop cable in 1" PVC conduit		
10	500 ft.	Loop cable in 2" PVC conduit		
11	150 ft.	Loop cable in 2" Rigid conduit		
12	500 ft.	Loop cable pole attached lashed to span wire (include conduit and weather head)		
13	100 ft.	Adder for hand trenching		
14	100 ft.	Adder for open cut installation and encasement in street		
15	150 ft.	Loop cable in bored installation of 2" rigid or HDPE conduit (include conduit)		
16	250 ft.	Loop cable in bored installation of 3" rigid or HDPE conduit (include conduit)		
17	20 Ea.	Installation of type II pull box		
18	20 Ea.	Adder per additional loop cable installed in conduit		
19	20 Ea.	Adder per additional 2-wire loop lead-in installed in saw cut		
20	20 Ea.	Installation of type 3 pull box		
		*SECTION TOTAL		\$

*The bid unit rates shall include the cost of all materials supplied by the contractor and all labor or equipment necessary to perform the work

** Bidders prices should reflect the all-inclusive amount based on their individual estimates.

POLE INSTALLATION

ITEM #	APPROX. QUANTITY	MATERIAL COST (Cont.)	UNIT COST	TOTAL COST
21	30 Ea	Install timber pole		
22	50 Ea	Install and provide guy wire / anchor		
23	30 Ea	Remove timber pole		
24	10 Ea	Adder per foot additional foundation depth		
25	10 Ea	Install pole shaft on anchor base foundation		
26	5 Ea	Install reinforced concrete backfill embedded pole		
27	10 Ea	Remove anchor base pole shaft		
28	10 Ea	Install concrete/steel strain pole		
29	30 Ea	Install strain pole mast arm		
30	30 Ea	Install strain pole foundation		
31	50 Ea	Install steel foundation for pedestal pole		
32	5 Ea	Remove reinforced concrete backfill embedded pole (typ. 24" depth)		
33	5 Ea	Remove steel foundation for pedestal pole		
34	5 Ea	Remove reinforced concrete foundation for strain pole		
35	5 Ea	Remove anchor base foundation (typ. 24" depth)		
36	200	3 stack 12" LED signal heads		
37	40 Ea	336 pole mounted traffic signal cabinet fully loaded		

*The bid unit rates shall include the cost of all materials supplied by the contractor and all labor or equipment necessary to perform the work.

** Bidders prices should reflect the all-inclusive amount based on their individual estimates.

TRAFFIC SIGNAL MAINTENANCE

ITEM #	APPROX. QUANTITY	MATERIAL COST (Cont.)	UNIT COST	TOTAL COST
38	250 Ea	Traffic signal sections cleaned "only" (existing LED signal heads)		
39	75 Ea	Installation of LED Traffic Signal Module		
40	100 Ea	Pedestrian signals sections cleaned "only" (existing LEDs)		
41	200 Ea	Installation of LED Countdown Pedestrian Signal module		
42	50 Ea	Traffic Signal Control Cabinet Maintenance		
43	200 Ea	Installation of ADA pushbutton stations		
44	250 Ea	Remove Incandescent Signal heads – 8" & 12"		
45	200 Ea	Remove Incandescent Pedestrian Signal heads		
46	200 Ea.	Remove non-ADA push buttons & signs		
47	50	2070 Traffic Signal Controller		

ITEM #	APX. QUANTITY	MATERIAL COST (Cont.)	UNIT COSTS	TOTAL COST
48	40 Ea.	Install 12 fiber single mode FDC		
49	265 ft	Install 6 fiber single mode aerial drop cable		
50	265 ft	Install 12 fiber single mode aerial drop cable		
51	65 ft	Install 6 fiber single mode underground drop cable		
52	65 ft	Install 12 fiber single mode underground drop cable		
53	1,500 ft	Install 48 fiber single mode aerial trunk cable		
54	1,500 ft	Install 72 fiber single mode aerial trunk cable		
55	4250 ft	Install 48 fiber single mode underground trunk cable		
56	4250 ft	Install 72 fiber single mode underground trunk cable		
57	40 Ea.	Install 6 fiber single mode FDC		
58	40 Ea.	Install 12 fiber single mode FDC		
59	10,000 ft	Install 96 fiber single mode aerial trunk cable		
60	15,000 ft	Install 144 fiber single mode aerial trunk cable		
61	1,000 ft	Install 96 fiber single mode underground trunk cable		
62	3,000 ft	Install 144 fiber single mode underground trunk cable		
63	50	Install Type 6 pull box		
64	1500	Install fiber connectors		
65	2500	Install fusion splice		
66	365 ft	Install 6 fiber single mode aerial drop cable		
67	365 ft	Install 12 fiber single mode aerial drop cable		

68	20	Install 6 fiber single mode FDC		
69	30	337 8 phase traffic signal cabinet loaded		
70	10,000 ft	7 conductor cable		
71	3,000 ft	4 conductor cable		
72	40 Ea.	332 fully loaded base mount cabinet with auxiliary output		
73	40 Ea.	336 fully loaded base mount cabinet		
74				\$
			*SECTION TOTAL	

*The bid unit rates shall include the cost of all materials supplied by the contractor and all labor or equipment necessary to perform the work.

** Bidders prices should reflect the all-inclusive amount based on their individual estimates.

The City will award this contract based on the following methodology:

Total Equipment Subtotal \$_____ x 20% = _____

Total Material Subtotal \$_____ x 60% = _____

Total Labor Subtotal \$_____ x 20% = _____

Total In Words \$_____

*The bid unit rates shall include the cost of all materials supplied by the contractor and all labor or equipment necessary to perform the work.

**This total includes section totals for detector loop and cable, pole installation, traffic signal maintenance and all other equipment.

Attachment No. 2

Scope of Work or Services

EXHIBIT E

SCOPE OF WORK OR SERVICES

CITY OF ATLANTA
DEPARTMENT OF PUBLIC WORKS/ OFFICE OF TRANSPORTATION

**FC-8319, CONSTRUCTION/PROFESSIONAL SERVICES FOR THE INSTALLATION, MAINTENANCE AND
REPAIR OF TRAFFIC SIGNALS SPECIFICATIONS GENERAL**

The City of Atlanta has passed the RENEW Atlanta Infrastructure bond. The Department of Public Works will be addressing its aging traffic signal infrastructure. The bond is the first step in making these improvements. Improvements include traffic signals, school beacons, and traffic signal communications

1.0 DEFINITIONS

- 1.1 City: City of Atlanta (COA)
- 1.2 Owner: City of Atlanta, Georgia, or its authorized or legal representatives
- 1.3 State: State of Georgia
- 1.4 Subcontractor: A person, firm or corporation supplying labor and/or materials for work on this project for, and under separate contract or agreement with, the Contractor
- 1.5 GDOT: Georgia Department of Transportation
- 1.6 AWG: American Wire Gauge
- 1.7 THHN: Thermoplastic High Heat resistant Nylon coated

2.0 GENERAL RESPONSIBILITIES AND REQUIREMENTS

- 2.1 Notices, Signals and Precautions: The Contractor shall supply, erect and maintain all street warning signs, beacons and other safety devices in a manner to ensure the safe and expeditious movement of vehicular and pedestrian traffic while the work is in progress, and take any other precautions which in the judgment of the Engineer may be necessary to protect life and property. Warning devices and methods of traffic control must conform to standards adopted by the City of Atlanta and set forth in the Institute of Transportation's *"Manual on Uniform Traffic Control Devices"*.
- 2.2 Working Hours - Disruption of Traffic: Any weekday daytime work, which disrupts vehicular traffic, shall be limited to between 9:00 a.m. and 4:00 p.m., Monday through Friday. However, at certain locations these hours may be further restricted or modified to avoid specific peak traffic movements.
- 2.3 Damage to Persons, Property, Etc.: The Contractor shall be responsible for all damage that may occur to persons, animals, vehicles, utilities, or property from lack of proper signing, lighting, watching, boarding, enclosing, or bracing, or any accidents due to defective scaffolding, shoring or any negligence on the part of the Contractor or his employees.
- 2.4 Contractors Responsibility: The Contractor is responsible for all equipment and operating conditions at all locations where work is being performed. The Contractor is responsible for damage and pilferage of equipment at the work location while construction is ongoing. The Owner does not assume responsibility until Owner has inspected and accepted the work. If the Contractor is on the

job and discovers a defect, which he cannot correct within the Scope of his/her Work; he/she must notify the Owner.

- 2.5 Trouble Calls: The Owner will respond as necessary to after hour trouble calls before the work at the work location has been accepted.
- 2.6 Familiarization with Work Orders: The Contractor in submitting his Work Order cost estimate represents that he has visited each Work Order location for the purposes of verifying existing conditions that may affect his work. Deficiencies discovered during this field check shall be presented in writing before work is initiated. Cost estimates shall include adequate provisions for existing conditions. Furthermore, the Contractor shall have reviewed the project plans and specifications for each Work Order, and be satisfied with their accuracy. Should any discrepancies appear in the plans and specifications, or the plans and specifications are not fully understood by the Contractor, the Contractor shall notify the Engineer in writing of such discrepancy for clarification. Work performed by the Contractor after such discovery and without a written response from the Engineer, will be done at the Contractor's risk and expense.
- 2.7 Notice of Deficiencies: The Contractor shall notify the Engineer in writing of deficiencies in existing conditions and abnormalities, and/or defects in City supplied material discovered during work in progress, which cannot be corrected within the Scope of Work of the Work Order, before continuing with that particular Work Order. Until the Engineer resolves the deficiency, the Contractor shall perform work on other Work Orders at the Engineer's direction.
- 2.8 Familiarization with Standards, Requirements and Field Conditions: It shall be the responsibility of the Contractor to familiarize himself with all applicable standards and requirements of the Owner and with physical conditions affecting traffic signals, reversible lane signals, and for street light installation or upgrading in the project area.
- 2.9 Disposal of Scrap and Salvage
 - 2.9.1 All material removed shall be the property of the City. The Contractor shall dispose of all debris and scrap material determined by the City to be of no value.
 - 2.9.2 The Contractor shall deliver all salvageable material to the City of Atlanta, Office of Transportation, Street Lights and Traffic Signals Shop at 124 Claire Drive, S.W., Atlanta, Georgia 30315.
- 2.10 Work Clean Up: The successful proponent shall clean up the area after the completion of each installation. In addition, the area shall be cleaned up daily as much as possible, and left in a safe condition.
- 2.11 Deviations from Specifications: The Contractor shall not deviate from these specifications without the written consent of the Engineer.
- 2.12 Reporting Requirements and Acceptance:
 - 2.12.1 Weekly Reports: The Contractor shall submit to the Engineer, no later than noon of the Monday following each workweek, a report of all work completed.
 - 2.12.2 Issuance and Accounting for Material Furnished by the City of Atlanta:
 - 2.12.2.1 The Contractor shall provide, with 48 hour notice to the Engineer, a list of materials to be picked up. The Contractor shall pick up all materials furnished by the City at the Traffic Signal and Street Lighting Shop, located at 124 Claire Drive, S.W., Atlanta, Georgia 30315. All material shall be signed for by a designated representative of the Contractor.

2.12.2.2 As a portion of the final inspection process, all materials issued to the Contractor shall be accounted for. Any surplus items shall be returned to the Traffic Signals Shop, located at 124 Claire Drive, S.W., Atlanta, Georgia 30315.

2.12.3 Acceptance of the Completed Job:

2.12.3.1 Prior to connection to a power source, the Contractor shall notify the Project Manager/Representative that a completed job is ready for inspection.

2.12.3.2 After inspection of the job by the Engineer (and other agencies which may require inspection) and the correction of all known deficiencies, the Contractor and the Engineer will energize the traffic signal(s). After the energizing of the traffic signal(s), the Contractor shall check the device for proper operation and make corrections of any deficiencies or malfunctions found. Additionally, the Contractor and the Engineer will conduct a final inspection.

2.13 Final Drawings: The Contractor shall submit to the Engineer, not later than 30 days after completion of all work, one set of revised drawings showing the "as built" condition of the finished job with red marks over the original drawings submitted with Work Order. The submittal shall utilize CAD (Computers Aided Design) drawings and be sealed.

3.0 SCOPE OF WORK AND REQUIRED CONTRACTOR QUALIFICATIONS

3.1 General Statement: The following specification describes typical general conditions and work procedures related to the installation, relocation, renovation or revision of traffic signals and/or related equipment within the City of Atlanta. It is the intent of the Department of Public Works / Office of Transportation to contract with an approved electrical contractor experienced in traffic signals who will undertake such work on an "as needed" basis. Reimbursement for installation or removal of traffic signal equipment will be on a quoted hourly rate basis. Bids are all inclusive and shall include unit prices. (see Exhibit D, Bid Form)

3.2 Contractor Qualifications and Experience:

3.2.1 General: This contract involves complex urban traffic signal **Installation** and requires five (5 years) of experience performing signal installation in a mid-major municipality. Contractor will submit a list of all of its' signal related projects for the past 5 years. Projects should have a cumulative value (over the past 5 years) of at least TWO MILLION DOLLARS.

3.2.2 License: Contractor shall possess a valid Master Electrician license issued by the State of Georgia and must show evidence of qualifications to do the associated sidewalk and street repair/replacement.

3.2.3 Qualified Experience: Contractor shall demonstrate his ability to Install complex Traffic Signal Systems (which utilize 2070 microprocessor type controllers, fiber optics, wireless communication and video detection systems) of a scope and magnitude comparable to that envisioned for this contract. Experience on these types of traffic signals in the past five (5) years will be a principal criterion.

3.3 Typical Work Assignments:

3.3.1 Materials utilized in the construction process (see section 4.0, Materials And Installation Techniques - Traffic) shall, be furnished by the Contractor. All materials supplied should be from the City/GDOT Qualified Product List unless approved by Engineer. Contractor furnished materials will be reimbursed on an add alternate basis.

The Contractor may be required to perform any of the following types of work as shown in the Typical Field Installation Standards as spelled out on the GDOT website which can be accessed by going to www.GDOT.gov and Clicking on the *Standards* option under the *Georgia Department of Transportation: Official Site* option.

3.3.2 and as may be supplemented by project plans, work orders, wiring plans, manufacturer's specification and/or other instructions by the Engineer as follows:

3.3.2.1 Install, relocate or remove poles pedestals and/or mast arm assemblies (aluminum, steel or wood, direct burial or anchor base).

3.3.2.2 Install, relocate or remove signal heads (vehicular, pedestrian or lane signal).

3.3.2.3 Install or remove vehicle detectors (loop or other as specified) and associated equipment.

3.3.2.4 Install, relocate or remove conduit, conduit risers, couplings, pull boxes, ground rods, and other associated hardware.
(see Exhibit D, Bid Form).

3.3.2.5 Install, relocate or remove span wires and/or guy wires, and associated hardware.

3.3.2.6 Install, splice, terminate, relocate or remove single-conductor, multi-conductor, paired or fiber optic cable.

3.3.2.7 Install, relocate or remove various traffic signal control equipment items.

3.3.2.8 Install, relocate or remove reversible lane signal control equipment items.

3.3.2.9 Install, relocate or remove various street lighting equipment items.

3.3.2.10 Perform sidewalk and/or street repair work as necessary, incidental to the above.

3.3.2.11 Perform other work as necessary, incidental to the above.

3.3.3 Routine work will be assigned in the following manner:

3.3.3.1 The number of anticipated Traffic Signals has been defined in the Notice to Bidders.

3.3.3.2 The Engineer will prepare a list of locations in the form of a Work Order to the Contractor. The Work Order will consist of Final Design Plans for no more than ten (10) Traffic Signal Locations.

3.3.3.3 If proposed, the contractor will have ten (10) working days to provide the Engineer with an estimate and work schedule for the work on the Work Order by estimating the work effort involved for each traffic signal location specified in the work order, by applying his previously quoted hourly rates. This estimate is to include:

3.3.3.3.1 Labor: Hourly rates and hours per category of employee for the work described for each location in the Work Order. Hourly rates quoted shall include measurement and payment specifications. (see Exhibit D, Bid Form).

3.3.3.3.2 Hourly rates and hours per category of equipment for the work defined for each location in the Work Order. (see Exhibit D, Bid Form).

- 3.3.3.3.3 Material prices including mark-up percentage for Proposed Contractor supplied materials for each location in the Work Order. (see Exhibit D, Bid Form).
- 3.3.3.3.4 Sidewalk replacement prices per square yard and the number of square yards of sidewalk to be replaced at each location (see Exhibit D, Bid Form).
- 3.3.3.3.5 Any assumptions utilized in preparation of the estimate for each traffic signal location identified in the Work Order. (see Exhibit D, Bid Form).
- 3.3.3.3.6 Notification and demonstration of any deficiencies, or other problems associated with the Work Order that affect this work and that could ultimately impair the satisfactory operation and optimum performance of the work as specified in the Work Order. (see Exhibit D, Bid Form).
- 3.3.3.3.7 The Engineer will have ten (10) working days to review, and approve or reject the Contractor's estimate and work schedule.
- 3.3.3.4 The Engineer may at any time during this review period return the estimate and work schedule to the Contractor for further refinement. Upon return of an estimate for refinement, the Contractor will have five (5) working days to amend the estimate for re-submittal. During the five (5) day period contractor will work at risk at the agreed upon unit prices.
- 3.3.3.5 Engineer will have ten (10) working days to review, and approve or reject a resubmittal.
- 3.3.3.6 A meeting will be scheduled between the Engineer and the Contractor on or before the tenth (10th) day of the Engineer's review, subject to the Engineer's approval of the estimate and work schedule. If the Engineer has approved the estimate, the Contractor will receive from the Engineer at this meeting, written approval of the Work Order estimate, work schedule and Authorization to Proceed.
- 3.3.3.7 The Engineer has the right to delay start of the work order from the scheduled meeting approval date for up to five working days.
- 3.3.3.8 Work may not begin on an approved Work Order until the previous work order has been completed to the satisfaction of the Engineer, or otherwise approved in advance by the Engineer.
- 3.3.3.9 The Contractor is obligated to the schedule proposed for each Work Order. Penalties for non-performance by the Contractor may be assessed.
- 3.3.3.10 Mobilization costs will be permitted on a **one time only** basis at the initiation of the Contract. This mobilization cost must be included in Contractor's bid and is a separate bid item. Additional mobilization or demobilization costs incurred by the Contractor will not be supported by the Engineer unless an interruption of work in progress is instigated by the Engineer or the time frame between the completion of one Work Order and the submittal by the Engineer to the Contractor of the subsequent scheduled Work Order for estimation exceeds ten (10) working days. The COA reserves the ultimate right to disallow any and all mobilization or demobilization cost beyond the one time only mobilization cost included in Contractor's bid.

4.0 MATERIALS AND INSTALLATION TECHNIQUES - TRAFFIC SIGNALS

4.1 General Statement: The following minimum criteria shall be met for all materials and installation to be employed by the Contractor and utilized in the performance of work associated with this contract.

As stated in Section 3.3.1, materials utilized in the construction process shall be furnished by the Contractor on an add alternate basis.

All material will be selected from the GDOT" qualified product list" unless otherwise approved by the Engineer.

Typical materials to be supplied by the Contractor include but are not limited to:

- Controllers, Cabinets and Cabinet Foundations
Poles and Pedestals
- Mast Arms
- Signal Heads - Vehicular, Pedestrian and Lane Signal including Mounting Hardware
- Conduit, Fittings, Messenger Wire
- Single and Multimode-Fiber Optic Cable
- Interconnect Cable

The Contractor will not be reimbursed for expendable materials/consumable items (i.e. loop saw blades, jackhammer tips, signs, traffic control materials, etc.). Tools such as drills, threaders, benders and come-alongs are considered incidental to the job.

4.2 Traffic Signal Wiring

4.2.1 Field Wiring

4.2.1.1 All THHN² (Thermoplastic High Heat resistant Nylon coated) Wire, except for electrical service (cut in), shall be minimum #14 AWG¹ (American Wire Gauge), solid, minimum 3/64" insulation, minimum voltage rating of 600 volts. Multi-conductor cable shall conform to IMSA Specification #20-1. A twelve (12) conductor cable shall be run from the controller cabinet to each corner of a signalized intersection. Runs to five (5) section signal heads shall be via 7-conductor cable. Runs to three (3) section signal heads shall

be via 4-conductor cable. All wire shall be color coded in accordance with Office of Transportation standards.

- 4.2.1.2 Only splices, junctions or taps that conform to the City's wiring standards will be allowed in signal feeder cable without the approval of the Engineer. The Contractor shall also gain the approval of the Engineer for all splicing materials and splicing methods he proposes to utilize.
- 4.2.2 Service Wiring: Electrical service (cut-in) feed wire shall be minimum #8 AWG THHN wire, stranded, minimum 3/64" insulation, and minimum voltage rating of 600 volts and shall be color coded in accordance with National Electrical Code standards.
- 4.2.3 Inductive Loop Wiring: The loop wire shall be continuous, unspliced #14 AWG and shall be spliced (utilizing silicon filled wire-nuts) to the lead-in cable. Detector lead-in shall be 2-Conductor, shielded, #14 AWG cable with conductors twisted two turns per foot, conforming to IMSA Specification #50-2.
- 4.2.4 Interconnect Cable: Unless otherwise defined in the work order documents, interconnect cable shall consist of either multi-pair cable conforming to REA Specification PE-38 or PE-39 or Fiber Optic Communications Cable. All connections or splices in interconnect cable must be made in traffic signal controller cabinets, other weather-proof cabinets or other splice enclosures, approved by the Office of Transportation.
- 4.3 Conduit and Related Hardware: Conduit shall be installed in accordance with Traffic and Transportation standards and the National Electrical Code in a neat, workman like manner. Conduit shall be installed in sidewalk and roadway areas except where permitted otherwise by the Engineer.
 - 4.3.1 (Acceptable - Conduit) pipes:

All conduit risers up poles shall be comprised of hot-dipped Galvanized steel conduit, couplings and fittings. All conduit runs not installed under roadways may be hot-dipped galvanized steel or PVC Schedule 40 conduit, couplings and fittings. All conduit runs under roadways may be hot-dipped galvanized steel, or PVC Schedule 80 concrete encased or HOPE (High Density Polyethylene Pipe). If PVC conduit is elected to be used, the procedures and adhesive used shall comply with the manufacturer's specifications. The mixing of hot-dipped galvanized steel and PVC conduit; couplings and fittings are not allowed within any individual point-to-point conduit run unless approved by the Engineer.
 - 4.3.2 Conduit Size

The size and number of conduit runs shall accommodate the specific application, in conformance with the National Electric Code standards, and may be augmented by direction of the Engineer. The following minimums shall apply:

 - 4.3.2.1 Detector runs: Risers -- Minimum (1) - 1". Detector runs: Underground -- Minimum (1) - 2"
 - 4.3.2.2 Interconnect cable: Minimum (1)-2".
 - 4.3.2.3 Bracket Signal head feed: Minimum (1)-1".
 - 4.3.2.4 Controller Cabinet to pull box (3)-2" and (2)-1".
 - 4.3.2.5 Pull box to Steel or Wood Pole at Controller Cabinet (3)-2" and (2)-1"

4.3.2.6 Pull Box to Steel or Wood Pole at Controller Cabinet (3)-2" and (2)-1"

4.3.2.7 Pull box to Pedestal Pole (1) 2"

4.3.2.8 Mast Arm Installations Street Crossings Pull box to Pull box (2)-2"

4.3.3 Conduit Hardware

All bolts, nuts and hardware of similar nature shall be hot-dipped galvanized steel.

4.3.4 Installation: Conduit ends shall be properly threaded and reamed (for rigid), or free of burrs and sharp edges (for PVC). Conduit installed for future connections shall be capped to prevent water and foreign matter from entering the conduit system.

4.3.5 Bends: All bends shall be of long sweep, free from kinks and of such each curvature as to permit the drawing in of cables without injury to insulation. The conduits should be brushed before cables are pulled.

4.3.6 Tests: At the option of the Engineer, the following tests or similar tests may be required by the Engineer: after installation of conduit is completed, all conduits installed under this contract shall be tested with an 80% mandrel. It is suggested that a mandrel kit, such as the Ensley Model E-800 kit be used. All conduits which will not allow passage of the mandrel shall be repaired to the satisfaction of the Engineer; if repairs cannot be effected, the conduit shall be removed and replaced at no additional cost to the Owner.

4.3.7 Depth: Conduits shall be laid to a depth of not less than 18", except under roadway and driveway conduits shall be laid to a depth of not less than 24". Unless otherwise approved by the Engineer. Also, it is highly desirable that conduits be driven or bored under driveways and pavement at street intersections.

4.3.8 Terminations: Conduits terminating in post or pedestal bases shall extend approximately 2" above the foundation.

4.3.9 Lubricants: Powdered soapstone, talc or other Engineer approved lubricant may be used in pulling cable in conduit. However, when interconnect cable is installed in conduit, an Engineer approved lubricant shall be used to facilitate the pull. All ends of cables shall be taped to exclude moisture and shall be so kept until splices are made and terminal appliances are attached, Ends of spare conductors shall be taped.

4.3.10 Grounding of Conduit: Underground conduits and neutral wires, if any, shall be bonded to minimum 5/8" X 8' copper clad ground rods, imbedded at each base. Bonding wire shall be #8 AWG THHN, (1-2) copper or larger (See TYPICAL FIELD INSTALLATION STANDARDS). Conduit shall be bonded to the base of each pole with #8 AWG THHN copper wire or larger, or equal. New poles on existing foundations shall be grounded and bonded in the same manner as for new foundations, except that ground rods need not be added if none exist.

4.4 Pull Boxes: Pull boxes shall be provided whenever necessary to afford adequate space for conduit terminations or whenever spacing between junctures exceeds 200'. Pull boxes shall be suitable for light vehicular traffic and shall sustain a minimum load of 50 p.s.i. However, when used in a roadway or driveway, it must sustain a minimum of 160 p.s.i. Pull boxes shall be of reinforced plastic mortar and shall be designed and tested to temperatures of - 50°F. Pull box shall meet or exceed all ASTM requirements, particularly as related to chemical resistance, water absorption and sunlight resistance. Dimensions for Type 1,2,3,4 and 5 Pull Boxes shall be in accordance with the attached specifications. (See TYPICAL FIELD INSTALLATION STANDARDS for installation details).

4.5 Messenger Wire: All messenger wire used for hanging span signals shall

be minimum 5/16" double galvanized, "A" coating seven (7) wire and shall be rated at 3,200 pounds minimum breaking strength. Messenger wire used for detector and other similar feed-ins shall be minimum 1/4" double galvanized, "A" coating and shall be rated a 1,900 pounds minimum breaking strength. All lashing wire shall be a minimum .045", stainless steel.

4.6 Installation of Signal Heads

4.6.1 All traffic signal heads shall be installed in strict accordance with the *"Manual on Uniform Traffic Control Devices"* standards, and with the City's Typical Field Installation Standards which mirror those on the GDOT website which can be accessed by going to www.GDOT.gov and Clicking on the *Standards option under the Georgia Department of Transportation: Official Site option*. This shall include the mounting of pedestal and bracket traffic signals at a height of ten (10) feet to bottom of signal, except that pedestrian signals shall be mounted to a height of eight (8) feet to bottom of signal. All span and mast arm signals shall be mounted such that the bottom of the signal is not less than 17 feet above the roadway surface and not more than 19 feet above the roadway surface.

4.6.2 All signals shall be properly aligned and must be free of any undue sag or imbalance. Normal sag shall be 3% to 5%.

4.7 Installation of Vehicle Detectors

4.7.1 Location of Vehicle Detectors: The installation of vehicle detectors shall be in accordance with the work order drawings. However, specific placement and size of all vehicle detectors may be changed at the discretion of the Engineer.

4.7.2 Loop Sealant: Loop detector sealant material must be 3M "Detector Loop Sealant", which is currently in use by the Office of Transportation. *No substitution of any other type of sealant material shall be used without prior approval by the Engineer.* Application of sealant material shall be in accordance with Typical Field Installation Standards as spelled out on the GDOT website which can be accessed by going to www.GDOT.gov and Clicking on the *Standards option under the Georgia Department of Transportation: Official Site option* and with manufacturer's specifications.

4.8 Installation of Pedestrian Pushbuttons

Pedestrian pushbuttons shall be installed in accordance with the Typical Field Installation Standards as spelled out on the GDOT website which can be accessed by going to www.GDOT.gov and Clicking on the *Standards option under the Georgia Department of Transportation: Official Site option*, as indicated on the work order plans.

4.9 Installation of Controllers and Cabinets

4.9.1 **Installation at Site:** the controller and cabinet, having been previously tested by the Office of Transportation, shall be installed in accordance with the intersection plans, the Typical Field Installation Standards as spelled out on the GDOT website which can be accessed by going to www.GDOT.gov and Clicking on the *Standards option under the Georgia Department of*

Transportation: Official Site option and the manufacturer's supplied box wiring prints.

4.9.2 Cabinet Wiring: All controller cabinet wiring shall be done in a neat manner and laced, and shall be in accordance with the box wiring prints supplied by the manufacturer and the Office of Transportation. The Engineer shall define acceptable wire termination devices.

4.9.3 Grounding: A 5/8" x 8' copper-clad ground rod shall be used for both base-mounted and pole-mounted cabinet installations. A #8 AWG solid copper wire shall be attached to the ground rod and to the controller cabinet ground bus bar.

4.9.4 Connection to the Power Source

4.9.4.1 It shall be the responsibility of the Contractor to arrange with the Georgia Power Company for the necessary power connections.

4.9.4.2 The Contractor shall run two service wires from the Georgia Power Service Point into the controller cabinet. Service wires shall be a minimum #8 AWG THHN stranded copper 600 volt wire.

4.10 Turn-On of New Signal Installations: Energizing the new traffic signal shall be accomplished on the same day that the signal heads are hung. If unusual conditions make this impossible, the signal heads shall be "bagged" with an opaque cover while inoperative. No signals shall be energized without the Engineer on the job site.

4.11 Special Requirements for Modernizing Existing Signal Locations: In order to minimize adverse impact to the general public, the existing traffic signal(s) shall be maintained fully operational until the new signal equipment is ready to be energized. To accomplish this, the Contractor shall follow the outline below.

4.11.1 Install new controller foundation, mast arms, poles, cabinet, conduit, messenger cables, field wiring, detectors, and any other items necessary, with the exception of signal heads, for normal operation.

4.11.2 Energizing of the new traffic signal controller shall be accomplished on the same day that the signal heads are hung, unless specific prior approval is obtained from the Engineer. Where prior approval is granted, all new signal heads shall be "bagged" with an opaque material and placed so as not to interfere with the existing heads or cause confusion to the traveling public. No traffic signals shall be energized without the Engineer present on the job site.

4.11.3 On the designated date of signal turn-on, the Contractor shall have sufficient manpower and equipment at the location to hang new signal heads in order to permit an operational test of the new equipment. After successful completion of the initial operational test, the Contractor shall immediately begin removal of the old signal heads. Should the new installation fail the initial operational test, the Contractor shall immediately "bag" or remove, at the discretion of the Engineer, the new signal heads and return the old equipment to-operation.

5.0 INSTALLATION OF POLES AND PEDESTALS FOR TRAFFIC SIGNALS

5.1 General Statement: The following minimum design criteria shall be met for all materials and installation techniques utilized in the installation or upgrading of poles or pedestals. The Engineer shall provide typical details.

* For bid purposes only please use typical foundation for a type IV strain pole.

5.2 Anchor Base Poles:

Anchor base steel poles shall be installed in accordance with the manufacturer's specifications. The anchor bolts shall be installed in a foundation of #3000 H.E. concrete; see the attached TYPICAL FIELD INSTALLATION STANDARDS for installation details.

5.3 Wood Poles: Wood pole installations may be of standard earth embedding, to a depth of six (6) feet.

Guy assembling shall be utilized whenever necessary to prevent undue leaning.

5.4 Signal Pedestals: Signal pedestals shall be installed by standard anchor bolt and concrete methods.

5.5 Plumb Installation and Accessory Equipment: All poles and pedestals shall be mounted as plumb (under loaded condition) as intersection condition permit. All accessory equipment (pole caps, ornamental bolt covers, hand-hole covers, etc.) shall be completely installed.

5.6 Installation of Poles over Basements or Under Unusual Conditions:

5.6.1 The successful proponent shall propose methods for installing poles in areas with hollow sidewalks (basements under sidewalks, etc.). The Engineer must approve exact design for installation in these areas on an individual basis.

5.6.2 The Contractor shall be responsible for sealing foundation areas to avoid basement leaks where such installations are required.

5.6.3 Where prevailing conditions are such that previously outlined techniques are not feasible, special provisions may be requested, subject to approval by the Engineer.

5.7 Excavating and Backfilling: All excavation required for the installation and placement of conduits, foundations, poles, and other appliances shall be performed in such a manner as to cause the least possible injury to pavement, sidewalks or other improvements. All conduits required to be under pavement, sidewalks, etc. shall be in place prior to commencing of base and paving operations. The trenches shall not be excavated wider than necessary for the proper installation of the electrical appliances and foundation. Excavating shall not be performed until immediately before installation of conduit and other appliances. The material from the excavation shall be placed in a position where the least interference with surface drainage will occur. All surplus excavated material shall be removed from the site and disposed of by the Contractor. The Contractor shall not open anymore in one day than he can cover at the end of the day to return the location to vehicle and/or pedestrian usage.

6.0 CONTRACTOR HOURLY RATES AND SPECIAL QUOTES

6.1 Hourly Rates: Proponents shall fill the attached BID FORMS with unit prices. Items include labor and equipment necessary to complete installation, relocation, removal, and/or revision of traffic signals, reversible lane signals and/or street lights and associated hardware in accordance with City of Atlanta specifications and standards. Evaluation of proposals and selection of the winning bid will be based on Engineer estimates of signal projects determined by the submitted hourly rates.

- 6.2 **Quotes for Materials:** The Contractor shall quote a percentage rate for materials he is to furnish for reimbursement on a "Cost Plus" basis.
- 6.3 **Quote for Emergency Response:** The contractor shall quote a rate to respond to all emergency requests. Emergency request are considered to be any maintenance/repair where the Contractor is asked by the Engineer to respond in 18 hours or less. This is a onetime cost associated with each emergency response. Any emergency responses that are the result of the Contractor's work will be done at no cost to the City.
- 6.4 **Sidewalk Work Unit Price:** Where sidewalk replacement is required as part of a Work Order, payment shall be based on a unit price per square yard. Materials, labor and equipment shall be included in that unit price per square yard. This unit price shall be included as a part of his bid. Sidewalk repairs and replacement are to be made at the direction and in conformance to standards established by the City of Atlanta, Public Services Division.

7.0 STANDARDS AND SPECIFICATIONS

- 7.1 General Statement: Effective July 1, 2011 the City of Atlanta adopted the Georgia Department of Transportation's (GDOT) Signal Design and Construction guidelines.

These standards can be accessed via the web by going to:

the GDOT website which can be accessed by going to www.GDOT.gov and Clicking on the *Standards* option under the *Georgia Department of Transportation: Official Site* option.